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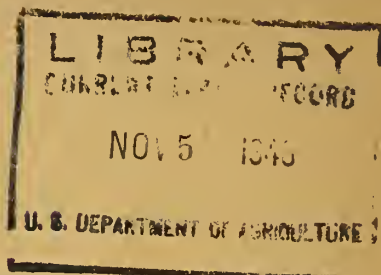
UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Summary Review of Monthly Reports*
for

SOIL CONSERVATION SERVICE RESEARCH**

AUGUST 1948



EROSION CONTROL PRACTICES DIVISION

Method of Seedbed Preparation and Alfalfa Yields - G. R. Free, Marcellus, New York.-"In 1946, alfalfa was seeded following an old timothy sod using 3 methods of seedbed preparation. Yields of second cutting were excellent for all treatments this year, and there was practically no grass or weeds.

Management	Air-dry hay, second cut, tons an acre	
	1946	1947
Disked.....	0.88	1.29
Subsurface plowed.....	.94	1.24
Turn plowed plus light application of straw.....	1.14	1.21

"It is apparent that method of seedbed preparation had little effect on yields this year."

Past Contour Cultivation, Nitrogen, and Irrigation Helps Wheat Yields - John Lamb, Jr., Ithaca, New York.-"Wheat was seeded in fields across many old plots the fall of 1947. Seeding was late -- September 25-27 -- for the high elevation of 1900 feet, and the imperfectly drained Mardin and Volusia soils. Old sods of mostly heavy grass were turned down only 1 to 3 weeks before drilling. In order to offset some of these unfavorable factors, 400 pounds of 10-10-10 was drilled in with the seed.

"Plots farmed on the contour from about 1939-44 made 29 bushels per acre, and those farmed up and down for the same period made 27 bushels. Since 1944, these plots were in mixed timothy and ladino clover.

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** All research work of the Soil Conservation Service is in cooperation with the various State Experiment Stations.

"A very heavy old timothy sod was plowed down late for wheat. The grain showed need for more nitrogen in the spring. A mixture of one-third ammonium sulphate and two-thirds sodium nitrate was broadcast by hand on May 19 at the rate of 125 pounds per acre. The extra nitrogen increased the yield from 15 to 24 bushels on the Volusia soil and 21 to 28 on the better-drained Mardin.

"Another old timothy sod was plowed down for wheat on a slope facing the northwest. There was little snow cover here and the wheat plants were exposed to the cold winter winds. It was dry after wheat seeding and late in October. Part of this field was sprinkled with approximately an inch of water from a farm pond. The yield on the watered area was 20 bushels per acre compared to 12 on the area not watered. In the same field in 1947, there was a plot of excellent ladino clover where an average of 300 pounds per acre of 5-10-10 was used for potatoes in 1947. This plot was out of range of water for irrigation, but yielded 24 bushels of wheat per acre compared to 12 bushels for the old timothy sod mentioned above.

"Under comparable areas, Cornell 595 wheat made 25 bushels per acre, and New Red 29. The latter stood up and lodged less."

Effect of Volclay Bentonite on Soil Permeability - G. R. Free, Marcellus, New York. - "Rod Fellows, local district conservationist, supplied some soil from a pond site and some Volclay, and asked us to determine whether it would have any appreciable effect on soil permeability. Our tests were not at all extensive or complete and certainly cannot be applied to other soils, but they did supply data which may be of interest to others.

"Samples of soil with and without the recommended amount of Volclay were packed in Proctor cylinders at optimum moisture for compaction (about 13%). The volume weights varied from 1.9 to 2.0, which are high values as we ordinarily think of compacted soils. These samples were subjected to a 3-foot head of water over a period of several days. All rates of water movement were extremely low, as might be expected, but indicated that the loss of 1 inch of water through the untreated cores would occur in about 7 days, whereas the corresponding length of time for the treated cores was about 35 days."

Relation of Water Drained from Soils to Recession of the Water Table - T. C. Peele, Clemson, S. C. - "During analysis of data from field installations where water table draw down curves have been secured it became evident that additional information was needed before draw down measurements could be related directly to soil permeability. It was noted that with increasing depths of the water table below the soil surface the rate at which the water table receded decreased markedly even after being corrected to equivalent hydraulic gradients.

"A study was initiated in the laboratory at Clemson to secure some data showing the relation of volume of water drained from soil to the amount of lowering of the water table per unit volume drained as the water table dropped from even with the soil surface at the beginning of the experiment to 3.5 feet below the surface at the end of the experiment.

"The tests were conducted in brass cylinders 5-1/2 inches in diameter and 4 feet in length with glass manometers on the outside of the cylinders to indicate the heights of the water tables and drain tube near the bottom of the cylinders for draining water from the soils. The height of the water table and the volume of water drained from Cecil clay and from loamy sand for each 0.5 foot drop in the water table are shown in the following tables.

"It was necessary to remove 1.49 surface inches of water from the Cecil clay to lower the water table to a depth of 2 feet below the surface. In the case of the loamy sand it was necessary to remove 4.17 surface inches of water to lower the water table to a depth of 2 feet below the surface. It would appear that this type of information should be very useful as an aid in interpreting water table draw down curves and relating them to soil properties. For example, suppose each of these soils had a soil zone of very low permeability beginning at the 2 foot depth and that the water had to pass through this zone to be drained from the soil, under such circumstances the sandy soil would present a more serious drainage problem than the Cecil clay since over twice as much water would have to pass through the slowly permeable layer at the 2 feet depth in the sandy soil than the Cecil clay to lower the water table to a depth of 2 feet below the surface.

It appears reasonable that drainage curves of the type illustrated by tables 1 and 2 could be related to the volume of water drained from soils under tensions of 60 cm. as measured in permeability work and that a much more intelligent interpretation of water table draw down data from field installations could be made than is possible at present, particularly where such measurements are being made without securing volume measurements on the effluent from drainage ditches or tile lines.

Table 1.--Relation of Water Table Recession to Quantity of Water Drained From Loamy Sand

Depth from Surface of Soil to Water Table (feet)	Inches of Water Drained from the Soil	
	per 0.5 foot drop in water table	Total
0 - 0.5	.32	.32
.5 - 1.0	.63	.95
1.0 - 1.5	1.55	2.50
1.5 - 2.0	1.67	4.17
2.0 - 2.5	1.67	5.84
2.5 - 3.0	1.67	7.51
3.0 - 3.5	1.67	9.18

Table 2.--Relation of Water Table Recession to Quantity of Water Drained from Cecil Clay

Depth from Surface of Soil to Water Table (feet)	Inches of Water Drained from the Soil	
	Per 0.5 foot drop in Water Table	Total
0 - 0.5	.12	.12
.5 - 1.0	.24	.36
1.0 - 1.5	.45	.81
1.5 - 2.0	.68	1.49
2.0 - 2.5	.80	2.29
2.5 - 3.0	.88	3.17
3.0 - 3.5	.93	4.10

Runoff and Soil Loss in Relation to Tillage and Cover Crop Treatments - T. C. Peele, Clemson, S. C. --During the month of July, 6.27 inches of rainfall occurred on the corn runoff plots. A summary of runoff and erosion from the different tillage methods during July is given in table 1, and the runoff and erosion from a single storm occurring July 15 and 16 is shown in table 2. The data in both tables show that the mulch tillage methods are quite effective in reducing runoff and erosion.

Table 1.--Summary of Runoff and Erosion from 6.27 Inches Rainfall on the Corn Plots During the Month of July 1948.

Tillage Treatment	Preceding Cover Crop	Runoff	Soil Loss
		percent	lbs./acre
Mulch, balk method	Vetch and rye	3.97	269
Mulch, disk method	Vetch and rye	8.76	748
Clean cultivation, plowed	Vetch and rye	21.75	1344
Clean cultivation, plowed	None	39.46	4082

Table 2.--The effects of cultural treatments on runoff and erosion from corn plots during 2.26 inches of rainfall July 15 and 16, 1948.

Tillage Treatment	Cover Crop	Runoff	Soil Loss
		Percent	lbs./acre
Mulch, balk method	Vetch and rye	5.13	147
Mulch, disk method	Vetch and rye	11.06	431
Clean cultivation, plowed	Vetch and rye	28.01	753
Clean cultivation, plowed	None	51.95	2455

Maximum intensities for 5, 15 and 30 minute periods were 3.84 in./hr., 3.60 in./hr., and 2.80 in./hr. respectively.

Yields of Wheat in Relation to Soil Management and Tillage Practices - F. L. Duley, Lincoln, Nebraska.

Treatment	Grain --		Straw --	
	Bushels per acre		Pounds per acre	
	Plowed	Subtilled	Plowed	Subtilled
Rotation - Corn, oats, wheat				
All residue utilized	25.8	25.7	1735	1825
Residue removed	21.6	--	1600	--
Subtilled for wheat and oats - Plowed for corn	--	23.1	--	1425
Plowed for wheat - subtilled for oats and corn	23.8	--	1810	--
Wheat after sweetclover, 2 years	47.7	45.8	3670	3410
Sweetclover 2 years, oats, wheat	45.8	34.9	3410	2800
Brome sod, corn, corn, oats, wheat	30.0	29.0	2340	2260
Wheat after fallow - Wakelin Field	--	41.5	--	3890
Wheat after oats with volunteer partridge pea	--	24.1	--	1815

Yields of Oats in Relation to Soil Management and Tillage Practices-
Lincoln, Nebraska, 1948 - F. L. Duley, Lincoln, Nebraska.-

Treatment	Grain --		Straw --	
	Bushels per acre		Pounds per acre	
	Plowed	Subtilled	Plowed	Subtilled
<u>Lincoln</u>				
Rotation - Corn, oats, wheat				
All residue returned	40.2	34.9	1285	1224
Residue removed	35.3	--	1180	--
Subtilled for oats and wheat, plowed for corn	--	44.6	--	1466
Subtilled for oats and corn, plowed for wheat	--	37.3	--	1246
Field 22 - Legume, corn, oats				
Biennial sweetclover 1946	53.6	52.7	1619	1696
Hubam sweetclover	51.1	52.4	1589	1695
Partridge pea	41.8	42.5	1371	1351
Lespedeza	42.0	42.2	1341	1340
No legume	43.0	40.5	1385	1312
Sweetclover 2 years, wheat, corn, oats	68.0	72.0	2105	2154
Sweetclover 1 year, sorghum, corn, oats	59.4	55.7	1915	1815
Sweetclover 1 year, corn, corn, oats	68.0	68.1	2190	2125
Sweetclover 2 years, no nurse crop, oats	75.0	67.7	2150	2135
Sweetclover 2 years, with nurse crop, oats	53.2	43.9	1650	1655
Alfalfa 1931-40. Corn, corn, oats and legume	--	73.8	--	2292
<u>Hastings</u>				
Sweetclover 2 years, oats	43.8	43.8	1722	2641
Summer fallow 1947	53.9	55.5	1855	1510
Sweetclover 2 years, wheat, corn, oats	35.2	36.7	1205	1222
Sweetclover 1 year, corn, oats	--	45.3	--	1833
No legume, corn, oats	--	20.8	--	535
Bromegrass, corn, corn, oats	45.9	34.2		
Bromegrass, oats - No nitrate fertilizer	11.5	--	412	
Bromegrass, oats - 150 lbs. ammonium nitrate late	24.4	--	635	

The Unusually Low Rainfall in May and June Caused a Marked Reduction in the Pasture During July and August - G. M. Browning, Ames, Iowa.-

"The pastures in the pasture-grazing experiment made excellent growth in May and June. In July the amount of growth was very limited and the steers soon used up the forage that was there and were without pasture by the middle of July. It was necessary to move them from the pasture-grazing experimental area to a supplemental area which had been harvested for hay. They were left on this area for 28 days and now have been returned to the original grazing experimental area. Recent rains have helped revive the brome and alfalfa but unless additional rains are obtained it is very questionable if there will be sufficient forage for continuous grazing up until October 1, the date when it was planned to start feeding the cattle in dry lot to finish them for market. The decrease in growth of brome and alfalfa in July apparently is associated with the lack of available moisture in the surface six feet of soil. Soil samples were taken for moisture determinations in July about the time when the cattle were taken off pasture. These moisture contents are shown in the following table. In general there is no available moisture for plant growth at the depth the samples were taken. In addition to the lack of moisture for plant growth grasshopper infestation has been unusually severe this year and the pastures were severely damaged by the grasshoppers eating the leaves from the brome and alfalfa.

Percentage moisture of soil under continuous grazed pasture, Marshall silt loam, Soil Conservation Experimental Farm, Clarinda, Iowa, July 22, 1948--

Depth Sampled Feet	First Year Stand	Second Year Stand	Average
1	18.1	20.1	19.1
2	18.3	19.1	18.7
3	15.8	17.3	16.5
4	15.2	16.9	16.0
5	16.9	17.4	17.2
6	17.8	20.7	19.2

Note: Wilting point of this soil is (varies with depth) about 15-17%.

Effect of Tillage Methods on Wheat Yield Following Lespedeza Sod -
B. H. Hendrickson, Watkinsville, Ga.-"Crop yields of second year wheat and the following crop of volunteer lespedeza for 1948 secured by Mr. John R. Carreker indicate a strong repeated trend; preparing lespedeza sod land for wheat planting in the fall with a disc-harrow resulted in the lowest wheat yield. Ripper, disc-tiller and disc plow land preparation methods were all equally superior in terms of the wheat yield, producing approximately 50 percent more wheat than the disc-harrowed areas.

"The yields of Kobe lespedeza hay reacted differently. They were uniformly good, except on the disc-plowed areas where deep turning buried most of the shattered-out lespedeza seed. Here the stands of volunteer lespedeza were less dense and weeds more numerous."

Weed Problem in Wheat-Lespedeza Cotton Rotations - E. H.

Hendrickson, Watkinsville, Ga.--"As our Class III cropland fields operated in this 3 year rotation (of wheat lespedeza (2 years), Cotton (1 year)) gradually become more productive, weeds are becoming more and more a problem in the lespedeza. Mowing tall weed growth above the lespedeza by use of a high-cutting attachment on the mower cutter bar is the most practical weed control method so far developed."

The Effects of Winter Cover Crops of Rye, Ryegrass, and a Ryegrass and Vetch Mixture on Sweet Corn Yields - O. R. Neal, New Brunswick, N. J.-

"Average yields during previous years were shown in the July report. Yields during 1948 were low from all treatments but showed the usual wide variation following the different winter covers. The 1948 yields and the average yields for the past four years are shown in the following table.

Winter Cover	Sweet Corn yields - No. 1 ears per acre	
	1948	4-year average
Rye	2130	7370
Ryegrass	1040	6210
Ryegrass and vetch	6030	10010

"If rye is considered as a standard, the ryegrass cover has consistently reduced sweet corn yields while the ryegrass and vetch treatment has resulted regularly in yield increases. All of the plots receive 1000 pounds per acre of 5-10-10 fertilizer on the corn each year. No additional fertilizer has been applied for the cover crop."

Planting Dates and Planting Methods in Relation to Kudzu Survival -

E. C. Richardson, Auburn, Alabama.--"During the past four planting seasons, 1944 to 1948, kudzu plantings were made on different dates and by different methods. Plantings were made in late November, January, and February. Methods used were shallow furrows, deep furrows and hole methods. In the shallow furrow method a furrow was opened with a 6-inch turn-plow. Plants were placed upright adjacent to the perpendicular side of the furrow and held in place with soil pulled in by hand. The plants were then covered with two furrows run in an opposite direction of opening. The deep furrow method differed from the shallow furrow method in that a list was formed over the plants. This method was used only in the November planting for the purpose of determining the value of cover for winter planted plants. In the hole method a planting hole was opened with a mattock, and the plants set entirely by hand. Shallow furrow and hole methods were used at all locations for all dates, while the deep furrow method was used only in the fall and in Escambia, Chilton, Lee and Limestone counties. Commercial crowns were used as planting stock.

"Data from these studies show that survival of plants planted in November were slightly lower than that of plants planted in January and February. Higher survivals were obtained in February than from any other planting date. Lower survivals were obtained in North Alabama than in South or Central Alabama. This was particularly true for the November planting date. This is probably due to unfavorable weather conditions in North Alabama during the winter months. Method of planting did not greatly affect the survival of plants. Results to date indicate that plantings may be made successfully in Central and South Alabama any time from November on through the spring months. Lower survivals may be expected from the fall plantings. Available labor and equipment may be used during slack period this way."

Good Soil Management in Relation to Crop Yield and Soil and Water Conservation - Dwight D. Smith, Columbia, Missouri. - "High fertility as a result of soil treatments of commercial fertilizer, lime, legumes as green manure, and crop residue has produced high crop yields and has lowered the rate of erosion. Small grain yields were higher and erosion lower following soybeans than following corn.

"1948 yields at McCredie were as follows:

	Crop	Previous Crop	Fertilizer	Yield bu/ac.
Series II	Oats	Corn	None	4.3
"	Oats	Corn	200 lbs/ac of 10-20-20	35.2
"	Oats	Soybeans (grain)	"	56.2
"	Rye	Soybeans (grain)	"	46.5
"	Wheat	Soybeans (grain)	"	38.0
"	Wheat	Corn	"	22.0
Series III (Deep lime, rock phos- phate and shatter)	Wheat	Check plot	250 lbs/ac of 8-8-8	36.0
	Wheat	Shatter only	"	31.7
	Wheat	Shatter, deep lime and rock phosphate	"	37.4

"Runoff and erosion from mature corn and soybeans need not be much different than from grass and legume crops. Runoff data from several of the McCredie plots during August, 1948 are as follows:

	Rain August 26	Rain August 27
Amount	1.2 inches	2.0 inches
5-minute intensity	5.3 in./hr.	2.2 in./hr.
10-minute intensity	4.1 in./hr.	2.2 in./hr.
30-minute intensity	2.2 in./hr.	1.6 in./hr.

	<u>Rain August 26</u>	<u>Rain August 27</u>
Corn after oats without treatment:		
Runoff	.29 in.	.98 in.
Retention rate index	2.45 in./hr.	.44 in./hr.
Corn after sweet clover under:		
Runoff	none	.40 in.
Retention rate index	5.3 in./hr.	1.13 in./hr.
Corn after 2 years grass legume meadow:		
Runoff	none	.20 in.
Retention rate index	5.3 in./hr.	1.4 in./hr.
Soybeans (rows) after rye as winter cover following corn:		
Runoff	none	.09 in.
Retention rate index	5.3 in./hr.	1.7 in./hr.
Grass legume meadow, Runoff	none	.08 in.
Grass legume pasture, Runoff	none	.33 in.
Wheat-lespedeza pasture, Runoff	none	1.00 in.

Pasture Management in Relation to Beef Production - Harley A. Daniel, Guthrie, Oklahoma.—"On August 31, the 40 yearling steers used in the grazing experiments at the Guthrie Station were sent to market. During the period from April 23 to August 31 (131 days) they made the following amounts of beef on the various pastures:

<u>Pasture</u>	<u>Pounds of Beef Per Acre</u>
Cleared virgin land	79.7
Regrassed, eroded land	50.2
Regrassed, eroded, fertilized land ^{1/}	98.4

^{1/} Fertilizer applied was the equivalent of 100 pounds of super-phosphate and 100 pounds of ammonium nitrate per acre annually.

"These results show that the cattle on the fertilized pasture produced almost twice as much beef per acre as those on the unfertilized. In fact, the eroded fertilized pastures produced more beef than the virgin pastures."

Corn-Kudzu Combination Promising Crop for Dairy Farmers - T. L. Copley, Raleigh, N. C.-"A 30 acre field of kudzu on the State College farm was divided into rotated strips and each third strip planted to corn this past spring. This system was based on a similar layout on our Soil Conservation Experiment Station farm, which has been showing considerable promise during the last two or three years. Because of the dry weather the corn on the 30 acre field on the college farm had to be planted the second time and growth was somewhat smaller than normal. Cultivations were made without difficulty and the kudzu re-established itself after the last cultivation and completely covered the ground within a few weeks time. Around the middle of August the corn was harvested for silage with a field harvester, and the college people report that the silage yield was very good and that the harvester handled the corn-kudzu combination easily. This supports the results we are getting on the Soil Conservation Experiment Station and indicates that corn planted in kudzu can easily be harvested for silage, and the rotation seems practical for dairy farmers. The corn comes off in time to permit grazing of the intermediate strips of kudzu during late summer and early fall."

Steer Gains on Sudan Grass and Native Pastures - C. J. Whitfield, Amarillo, Texas.-"All pastures benefited by the above-normal rains received during the month of August. Although abundant feed was available, steer gains were only fair to good. Steers on sudan, August 1-15, just about held their own, whereas during the last half, they gained up to three pounds per day for an average of 1.85 pounds per day for the month. From August 1 to 14, about 5 inches of moisture was received on the sudan, while only .08 occurred the last 17 days. This made for succulent and perhaps a toxic condition. During the latter part of the month, the forage was in good grazing condition.

"In spite of the adverse conditions on sudan, gains were better than on native pasture H where the steers averaged only 1.1 pounds per day. The heavy moisture was responsible for large populations of flies and mosquitoes. Although the steers were sprayed on August 1, the effectiveness of the spray had decreased greatly by September 1, and large numbers of mosquitoes were found at that time."

Tobacco Field Trials with Ridged Rows - C. S. Britt, Beltsville, Maryland.-"The two farmers using ridge rows and coarse organic matter (late turned cover crops) are well satisfied with the outstanding results obtained this year. The unusually heavy rains during the middle of June caused severe erosion and leaching damage throughout most of Southern Maryland.

"Mr. H. W. Townshend, a field trial cooperator, from Mitchellville, Maryland, reports that he was driving home during one of these storms and that soil and tobacco plants were washing right out in the road from his neighbors' fields. When he arrived home, water in his waterway was nearly clear and no damage had occurred in his tobacco field."

"Mr. Townshend was able to plant a little more than half his usual tobacco acreage. However, he is now looking for extra barn space because the crop is so heavy. Several county agents and Soil Conservation Service technicians from the tobacco area visited Mr. Townshend's place the middle of August. They said that this was one of the best fields of tobacco they had seen all year.

"Mr. Calvert Norfolk, from Calvert County, reports that he lost absolutely no soil from his tobacco field with ridge rows, while the erosion damage was severe on all his flat planted tobacco.

"Tobacco from the ridged row area is some of the best tobacco he ever grew, while the tobacco from flat cultivated areas is some of the poorest tobacco he ever grew.

"Our 1948 studies of ridged rows versus flat rows at Beltsville are showing strongly in favor of ridged rows. One of the reasons appear to be that plant nutrients are better conserved in the ridges during excessive rains."

Nitrate Release Under Crop Residue Decomposition - Roy C. Dawson, College Park, Maryland.-"One-year Rotation Plots: The nitrate nitrogen content of plot soils located on the Soil Conservation Service Research tract at the Beltsville Research Center, was determined. The plots were maintained by Mr. C. S. Britt for the purpose of determining the effect of various cover crops in a 1-year rotation on yield and quality of tobacco. The cover crops used were weeds, rye grass, a mixture of rye and vetch, and vetch alone. Each cover crop was plowed under at two different dates. The early turning was made on April 13 and the late on May 20. Ridge rows were thrown up after plowing and tobacco planted in the ridges about the middle of June. Nitrogen in mixed fertilizer was broadcast at the rate of 40 pounds per acre before ridging. The top foot of soil was sampled on July 1, August 13, and August 24.

(a) Ridges vs furrows. During the process of ridge-rowing top soil is removed from the furrows and thrown up into ridges. The distribution of nitrate nitrogen between the top foot of ridges and furrows on July 1, which was 42 days after late turning and 79 days after early turning of the various cover crops, is shown in table 1.

Table 1.--Nitrate nitrogen (ppm) found in top foot of ridges and furrows of tobacco plots after early and late turning of cover crops

Location	Bare (Weeds)		Ryegrass		Rye - Vetch		Vetch		
of Sample	Early	Late	Early	Late	Early	Late	Early	Late	Mean
Ridges	15.4	11.4	15.3	9.2	14.6	12.2	12.2	18.4	13.6
Furrows	2.2	2.3	2.5	1.6	3.4	4.1	2.4	4.7	2.9
	:	:	:	:	:	:	:	:	:

"Nitrate nitrogen was consistently greater in the ridges than in the furrows.

(b) Date of Sampling. On July 1 the tobacco plants growing on the ridges were small and apparently exerted little effect on soil nitrates. Nitrate nitrogen content of the soil (table 2) was at a relatively high level (mean = 13.6 ppm).

Table 2.--Nitrate nitrogen (ppm) found in top foot of ridges of tobacco plots at different dates after early and late turning of cover crops

Date of	Bare (Weeds) :		Ryegrass :		Rye - Vetch :		Vetch :		
Sampling	Early	Late	Early	Late	Early	Late	Early	Late	Mean
July 1	15.4	11.4	15.3	9.2	14.6	12.2	12.2	18.4	13.6
Aug. 13	1.4	0.9	1.5	1.1	1.0	1.3	2.7	4.6	1.8
Aug. 24	1.0	0.9	0.9	0.8	1.0	0.8	1.5	0.8	1.0

"The highest nitrate content (18.4 ppm) was found where vetch had been turned under 42 days before. Vetch that had been turned under 79 days before showed a nitrate nitrogen content of 12.2 ppm. All other crop residues showed a higher nitrate content on July 1 under early turning (79 days) than under late turning (42 days). On August 13 the nitrate content was much lower under all treatments (mean = 1.8 ppm) than on July 1 (mean = 13.6 ppm). On August 24 the nitrate content of all plots had been reduced to a uniformly low level (approximately 1 ppm). The tobacco was large and green on the vetch plots and comparatively small and yellow on the bare plots."

DRAINAGE AND WATER CONTROL DIVISION

Hydrologic Studies - L. L. Harrold, North Appalachian Experimental Watershed, Coshocton, Ohio.--"The second lowest August rainfall of 0.92 inch in 58 years of record occurred during the month. This is only 20 percent of normal. Ground-water levels are low and stream flow has ceased at some gaging stations. Corn is showing definite signs of the drought. Soil moisture in mulch corn plots is greater than that in the plowed plots.

"Infiltration and runoff for four corn watersheds is shown in table 1. Of all the contour corn watersheds, No. 191 (plowed corn, no cultivation, 2,4-D weed control) had the greatest runoff and the least rate of infiltration. The rates of infiltration were those prevailing at the time the storm runoff stopped. Least runoff occurred on the mulch corn watershed No. 188. Here infiltration values are correspondingly greater,-- whenever there was significant runoff.

Table 1.--Runoff and infiltration
for 4 corn watersheds
July 1948

Date	Runoff from Watershed No.-- (inches)				Final infiltration rate on Watershed No.-- (inches per hour)			
	106 ^{1/}	121 ^{2/}	188 ^{3/}	191 ^{4/}	106	121	188	191
July 12	0.004	0	0	0	0.17	0.17	0.17	0.17
16	.01	.001	0	.06	.47	.47	.47	.20
22	.16	.05	.001	.29	.42	.47	1.05	.22
27	.54	.35	.04	.57	.10	.15	.5	.14

^{1/} Watershed No. 106 plowed corn in straight rows, cultivated.

^{2/} Watershed No. 109 plowed corn on contour, cultivated.

^{3/} Watershed No. 188 mulch corn on contour, no cultivation.

^{4/} Watershed No. 191 plowed corn on contour, no cultivation."

Hydrologic Studies - J. A. Allis, Central Great Plains Experimental Watershed, Hastings, Nebraska.-"Only 0.91 inch of rain fell in August, which was measured on ten different days during the month. Since no rain was over 0.40 inch, very little moisture was available for the crops. At least a half inch rain is needed at one time in order to penetrate to the roots and derive any benefit to the plants. Because of the moderately cool weather and previous rains in June and July the corn did not show much lack of moisture until about the middle of the month. On August 23, 24, and 25 we had maximum temperatures ranging from 101° to 103° with an average wind velocity of 14.1 miles per hour for the 3 day period and 2.34 inches evaporation from the Weather Bureau pan. The corn crop virtually dried up during this period. Most of the corn had started to dent, hence, we will still have an average corn crop in this section, however, there were prospects of a bumper crop. Northern Kansas and South Central Nebraska were the hardest hit localities.

"The 1948 oats samples were weighed and the average yields were computed for the 4-acre watersheds as follows:

Oats	Straight Row	13.8 bu. per acre
Oats	Contoured	15.4 bu. per acre
Oats	Subtilled	13.7 bu. per acre

Hydrologic Studies - R. B. Hickok, Lafayette, Indiana.-"August was exceptionally dry. The average rainfall measured at the Throckmorton Farm was 1.77 inches, compared with a probable August normal for Lafayette of between 2.94 and 3.79 inches. However, the accumulated annual rainfall for the year remained within the 'normal' range. Rain fell on August 17 and 18 in four storms, with totals ranging from 1.18 to 2.02 inches over the Throckmorton Farm. The only runoff was from one watershed in soybeans under the prevailing treatment, which lost approximately 0.30 inch of water. This watershed was in the area of greatest total rainfall. However, a contiguous watershed in soybeans under the conservation treatment produced no runoff.

"Wheat samples harvested from the experimental watersheds in July were threshed and weighed:

Table 1.--1948 wheat yields^{1/}/experimental watersheds
Purdue-Throckmorton Farm, Lafayette, Ind.

Treatment	Watershed No.	Bu./A ^{2/}
Conservation	6	36.6
	7	38.3
	Av.	37.4
Prevailing	5	24.5
	8	23.5
	Av.	24.0

^{1/}Average of 0.0002 acre samples at 50x50' intervals.

^{2/}Corrected to 13.5 percent moisture.

"The treatment difference included increased fertilization (150#/Acre drilled with the wheat on prevailing treated watersheds, and 500#/Acre on those under the conservation treatment), and a substantial reduction of runoff from those under the conservation treatment. From the date of seeding to harvest, the watersheds under the prevailing treatment lost an average of 14.5 percent of the rainfall in runoff, whereas those under the conservation treatment lost an average of 6.9 percent. The saying of water amounted to 7.6 percent of the total crop-period rainfall. This reduction of runoff on the conservation treated watersheds was affected by contour drilling of the wheat and by the return of increased crop residues to the soil and inclusion of a deep rooted legume (alfalfa) in the meadow seeding mixtures since 1943.

"There was very extensive 'firing' of corn over the northern part of the State. Considerable 'firing' occurred on the mulch tillage corn plots at Albion and Cromwell, together with other indications of insufficient available plant foods. Distinct differences in this respect between the several experimental treatments were not noted.

"The outstanding corn on the Throckmorton Farm this year is on a test area on which a heavy growth and residue of old meadow (not harvested for 2 years and heavily infested with weeds and briars) was chopped up with an experimental hammer-knife mower and the seed bed prepared with a heavy spring shank field cultivator, equipped with flat sweeps above the points, which cut the tap roots off near the surface. Although planted late, this corn has made excellent growth and the soil condition, with a large amount of chopped residues on and near the surface, has appeared to be very nearly ideal from the standpoint of moisture conservation and soil loss protection."

Hydrologic Studies - G. A. Crabb, Jr., East Lansing, Michigan.-

"As measured by the U. S. Weather Bureau type of non-recording rain gages, precipitation for the month of August amounted to 0.85 inch for the cultivated watersheds, 1.33 inches for the wooded watershed, and 0.79 inch for the stubble mulch plots. This is approximately 30 percent, 47 percent, and 28 percent of the 2.82 'normal' for East Lansing as computed by the U. S. Weather Bureau. In the period of 1864-1948 there were 11 times when the August rainfall was less than 0.85 inch.

"There were no runoffs during the month of August.

"On August 10, the State Conservationist's Office was furnished with East Lansing weather data in response to a request from the field. On August 11 the Farm Crops Department, MSC, was furnished with soil moisture data."

Runoff Studies - T. W. Edminster, Blacksburg, Virginia.--"During August, Mr. Holtan spent the major part of the month in the laboratory and in the library in research upon agents of flocculation and deflocculation, as well as studying the effects these agents have upon permeability.

"Some of the findings in the laboratory are as follows:

1. Deflocculation can be obtained chemically and does aid in sealing at least some soils; however, there is some evidence that chemical dispersion causes instability of compaction and further that dispersion is not as good a sealing method as is compaction.
2. Flocculation may be preferred for some soils over dispersion, especially as we approach the aggregate range of clay bonding.
3. Clay bonding appears quite effective, at least on some soils and is confined to admixtures containing 70 percent or more of sand and 30 percent or less of clay.

"For the present, the above evidence tends only to create confusion; however, it does indicate that there are too many factors acting simultaneously and in various directions which can nullify each other and otherwise disrupt regularity of behavior of factors. In view of this, present thinking is tending to design a formal study in which texture alone would be isolated. In such a study, an aggregate range and admixtures from clay to very coarse sand or gravel would be obtained and studied for permeability. Sharp sand would be used and silt sans organic matter and non-swelling clays. Swelling, organic matter, and roundness of sand particles would later be introduced for their effect. It is felt that in this manner we could isolate various factors and would not have to rely upon multiple regression for analysis."

Runoff Studies - N. E. Minshall, Madison, Wisconsin.--"Precipitation at Fennimore for August was 2.52 inches as compared with a normal of 3.60 inches. There were no high intensities and no runoff. The rainfall deficiency since May 20 was about 6.5 inches. Temperatures varied from a high of 96° on the 23rd to a low of 50° on the 5th, with the average for the month 71° or near normal. Precipitation at Edwardsville was 0.76 inch, all of which came in the first half month. Temperatures averaged about 4° below normal."

Hydraulic Studies - F. W. Blaisdell, Minneapolis, Minnesota.--"In August Mr. M. H. Berg submitted a thesis entitled 'Supercritical Flow in Straight-Wall Diverging Channels on Normal Slopes' in partial fulfillment of the requirements for the degree of Master of Science in Civil Engineering at the University of Minnesota. This thesis is an extension of the study on 1 percent slopes reported by Mr. Blaisdell in June 1947, in the paper entitled 'Flow Through Diverging Open Channel Transitions at Supercritical Velocities.' The results obtained by

Mr. Berg on normal slopes agree quite well with those obtained by Mr. Blaisdell on flat slopes when the Froude number is four or less. For higher initial Froude numbers the mean depth of flow at a given location is higher for the normal slope than for the flat slope, and conservative design requires the use of the proper curve. A copy of Mr. Berg's thesis is on file at this office and is available for loan."

Drainage Studies - M. H. Gallatin, Homestead, Florida.-

"General gains in the water table were recorded throughout the area as the rainfall for the area has been somewhat heavier this month than for the past few months. We recorded on our gages six different rains of over an inch in intensity, three of which were over 2-inch rains. The following are the totals for the month at our various stations:

Location	July 1948	July 1947
Redland and Mowry	6.07	11.63
Sub-Tropical Experiment Station	9.05	13.62
Redland and Gossman	7.76	14.95
Princeton Grove	5.92	11.67
Cooper Grove	8.93	13.38
West Mowry	5.86	4.77
Highlands	6.05	4.70
Cor. Avocado and Roberts	7.07	14.20

"It will be noted from the above that in most cases our August rainfall this year was about half that of a year ago, except in the southwest and western part of the Highlands and West Mowry area where we actually recorded more rain this year. As a result of these rains scattered throughout the month, gains in our water table of 0.77 to 1.33 foot were recorded for the Redland profile, the greatest gain occurring in the northern and western parts of the area. For the Eureka profile gains of 0.88 to 1.48 foot were recorded. On this profile we had a gain of over a foot in the west and coastal area. Our greatest gain in water table was recorded on the Mowry Street profile in the west 1.15 foot, the smallest gain 0.92 foot at the corner of Redland and Mowry, with a somewhat greater gain 0.96 foot in the East Glades area. In general, as indicated by our daily well readings at Well No. 5 (cor. Redland and Mowry), the water table on July 31 was somewhat lower than our readings on the two previous years as shown by the following: July 31, 1948, 3.34 feet m.s.l., July 31, 1947, 4.98 feet m.s.l., July 31, 1946, 4.90 feet m.s.l."

Supplemental Irrigation Studies - James Turnbull, Lake Alfred, Florida.-"The rainy season continued through August, with about 10 inches of rain being recorded at the experimental plots at Haines City during the month. The ground-water table and the lake levels continued

to rise and are now more than 2 feet higher than at this time last year.

"Since March, weekly measurements have been made on an irrigation well which is drilled to the Ocala strata. The water level in this well has risen steadily since June 28 and is now only 2-1/2 feet below the ground surface, indicating extensive recharging of this aquifer."

Supplemental Irrigation Studies - J. R. Carreker, Athens, Georgia.-"Harvesting tomatoes and lima beans on the vegetable plots was practically completed during the month. Corn was maturing normally. The unirrigated pasture was carrying one cow while the irrigated pasture was carrying three at the end of the month.

"Alfalfa hay was harvested August 27 on the 100-acre farm unit of the Southern Piedmont Conservation Experiment Station. Part of this alfalfa was irrigated July 27, and part left unirrigated. Although rains fell soon after the irrigation, the yield of air dry hay showed for the August 27 cutting:

Irrigated = 1.15 tons per acre
Unirrigated = 0.90 tons per acre

"Rainfall records at the irrigation plots showed the precipitation distributed through the month as follows:

Aug. 1-4	= 2.53	inches in a series of showers
Aug. 12	= .81	
Aug. 16	= .26	
Aug. 23	= .28	
Aug. 29	= .40	
Total	4.28	Normal = 4.58
Evaporation for the month = 6.256 inches		

"The vegetables (fixed minimum basis) were irrigated on the 23rd and (evaporation basis) on the 26th. The pasture was also irrigated 1.0 inch on the 26th.

"W. J. Liddell assisted Mr. J. E. Pollock, District Conservationist, at Augusta, Georgia in planning an irrigation demonstration to be held in the Little River Soil Conservation District September 23rd. Four irrigation equipment distributors have accepted the District's invitation to participate in the demonstration."

Sedimentation Studies - L. C. Gottschalk, Washington, D. C.-

"During August computations were completed and a report written on the sedimentation survey of Leavenworth County State Lake, Tonganoxie, Kans. This survey was made in cooperation with the State of Kansas during October 1947, 16.1 years after the reservoir was put into operation. During this time the average rate of sediment production from the 3.83 square-mile watershed above the reservoir has been 172 cubic feet per acre per year. Nearly 50 percent of the watershed is cultivated land and 31 percent pasture. Soil erosion has been high because of improper land-use practices and lack of conservation measures in the watershed. Despite the high rate of erosion the reservoir has been silting slowly because of the large amount of capacity developed on the small watershed.

"During the latter part of the month, I spent a week at Bloomington, Ill., and two days at Carbondale, Ill., assisting the Illinois State Water Survey Division in sedimentation surveys of the water-supply reservoirs located at each of these cities as part of the cooperative studies on reservoir sedimentation in that State. Computations of the results of these surveys are now in progress. The Carbondale Reservoir has previously been surveyed and a critical water shortage will soon develop in this vicinity as a result of the large amount of storage capacity displaced by sediment in this reservoir."

IRRIGATION DIVISION

Irrigation Studies - Yucaipa Valley, S.C.D. - Dean C. Muckel, Pomona, Calif.-"Four series of soil moisture samples were taken during the month in the Beaumont Fruit Company peach orchard, Yucaipa Valley, California. Volume weights were calculated from samples taken with a soil tube. Records for 1945-46 from 59 water users were collected and partially summarized. Up until the current year, the customary procedure was to be on a 21-day schedule for a 24-hour run or 48-hour run with one-half head. The average application was 2.78 acre-inches per acre. On advice by the Soil Conservation Service, the practice this year throughout the valley was changed to a 14-day schedule with about 1.5 acre-inches being applied per irrigation. The growers, in general, are satisfied with this schedule and our soil moisture samples indicate the trees are obtaining sufficient moisture where the irrigations are carefully controlled. Fruit growth measurements show a falling off in size where a 28-day irrigation interval was used as compared to a 14-day interval."

V. S. Aronovici, Pomona, Calif.-"A group of peach specimens in Yucaipa Valley were collected which covered a wide range of growth. Circumferences and volumes were determined and compared. Both cling and freestone fruit were measured and found to have essentially the same proportions. By comparing fruit volume rather than circumference, relationships between growth and soil moisture are marked. The difference in growth between a 14-day and 28-day irrigation cycle are tabulated below.

: 14-day : 28-day ::		: 14-day : 28-day	
: irrigation : irrigation ::		: irrigation : irrigation	
Date	: interval ^{1/} :	Date	: interval ^{1/} :
	Cubic in.		Cubic in.
June 7	1.42	July 12	2.04
10	1.52	19	2.28
14	1.59	26	2.80
17	1.70	Aug. 2	3.30
21	1.74	9	4.12
28	1.78	16	5.18
July 6	1.94	23	6.80

^{1/} Average of 32 fruit measurements; 8 fruit on each tree; four trees.

This evidence, although not complete, shows 24 percent difference in size. The total water applied is the same for both plots."

San Fernando Valley Drainage Investigation - William W. Donnan, Los Angeles, Calif.-"In connection with the experiments to trace artesian flow leakage between strata in abandoned wells, the following tabulation illustrates how the salt water moves upward in leaking wells. Two gallons of salt brine were pumped into the well at the 50-foot level and the movement of this brine to the 15-foot level was charted.

Electric logs of R-3 well, San Fernando Valley, California
(Conductance readings with galvanometer, in milliamperes.)

	:	:	After	:30 min.:	60 min.:	90 min.:	120 min.:	150 min.:	180 min.
Depth:	Initial:	salting:	later	: later	: later	: later	: later	: later	: later
Feet									
0	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
5	.40	.40	.40	.40	.40	.40	.40	.40	.40
10	.40	.40	.40	.40	.40	.40	.40	.40	.40
15	.40	.40	.40	.40	.40	.40	.41	.41	.41
20	.40	.40	.40	.40	.42	.41	.42	.41	.41
25	.40	.40	.40	.41	.42	.42	.41	.40	.40
30	.40	.40	.40	.44	.43	.41	.40	.40	.40
35	.40	.40	.45	.44	.42	.41	.40	.40	.40
40	.40	.40	.44	.44	.41	.40	.40	.40	.40
45	.40	.40	.44	.43	.41	.40	.40	.40	.40
50	.40	.48 ^{1/}	.43	.42	.41	.40	.40	.40	.40
55	.40	.48	.42	.40	.40	.40	.40	.40	.40
60	.40	.42	.41	.40	.40	.40	.40	.40	.40
65	.40	.42	.40	.40	.40	.40	.40	.40	.40
70	.40	.40	.40	.40	.40	.40	.40	.40	.40
75	.40	.40	.40	.40	.40	.40	.40	.40	.40

^{1/} Conductance of 0.48 of 47-foot depth."

Drainage of Irrigated Lands, Imperial Valley - George B. Bradshaw, Imperial, Calif.-"A study of the use of detergents and wetting agents as a means of cutting down the leaching period is being made in both the laboratory and field. A 0.1 percent solution of detergent, (sulfonated ester of ethel alcohol), was used in the falling head permeameter as leach water. The soil samples were heavy clay and were analyzed at 309 tons of salt per acre-foot. The permeability samples using tap water were very low and ceased to flow after the first or second day. The samples using detergent had a permeability of about 0.07 gallons per square foot per day and continued to run 28 days. This however, is an extremely low permeability for successful drainage work in the Imperial Valley.

"Fourteen plots of Double Dwarf Milo and Black-Eyed Cow Peas were planted to determine the effect of detergent on germination and plant growth. The plants were watered with various strengths of detergenated water

varying from 0.05 percent to 1.0 percent. Nearly all of the plants germinated and came up in the first 2 or 3 days. The detergent treated plants soon began showing effects and the strongest treated ones died. In 10 days the 0.05 percent detergent treated plants began to show very light effects. In actual field use the detergent solution would be weaker than 0.05 percent and would also be washed out by subsequent irrigations."

Water Spreading - San Joaquin Valley - A. T. Mitchelson, Dean C. Muckel, Hayden K. Rouse, Eldred Bliss.-A meeting of the group was held at Bakersfield the 9th and 10th regarding field test ponds at Minter Field and Wasco. The Minter Field ponds were not in operation because of lack of water supply. Several of the Wasco ponds were also out of operation in preparation for drying out and treatments before resumption of new percolation runs. The buffer pond at the Wasco site was again started on about August 10th after having been dried the 5 percent soil moisture point in order to start on a new test run. Two soil columns 4-inches in diameter by 6 feet long were taken with the Utah soil boring machine in the immediate vicinity of the pond in order to study stratification of sub-soils. These samples were taken to furnish data necessary in determining whether or not installation of a replica buffer pond was desirable.

At Madera, Muckel and Mitchelson conferred with research workers of the Bureau of Reclamation relative to condition and operation of the Madera test strips. There has been an ample supply of water behind Friant Dam for the operation of the Madera plots but there has also been considerable difficulty encountered in maintaining a steady supply of water at the plots. The water supply to the plots must traverse several miles of river channel and canals in being transported to the plots and consequently a diurnal fluctuation develops which causes excess water at times a deficient supply at other times during the day. There are no facilities to handle any appreciable excess of water at the plots. The Bureau of Reclamation, which furnished the water supply to the plots, is planning the installation of an equalizing pond near the supply canal intake. In order to get a complete picture of the sub-soil conditions at the Madera plot, arrangements were made to have the 6-acre tract graded with holes approximately 50 feet apart, using the Utah soil boring machine to take the soil cores. This will give us a more accurate pattern of the underlying hardpan, whether it is continuous, if it is sloping and in what direction. The elevation of the hardpan will be checked against both ground surface and sea level, elevations already determined. Since we have had rather mystifying percolation rates on this plot, it is hoped these borings will shed some light on variation in infiltration rates. It will also explain the behavior of a perched water table found over parts of the tract.

C. W. Lauritzen reports measurements on the lining in channels were continued.

"Permeability measurements on the linings in Channel C were begun. Mr. E. M. Ellsperman and Mr. V. F. Meisner from the Research and Geology Division, Bureau of Reclamation, Denver, Colorado, spent most of the week of August 22 assisting with the installation of experimental linings in Channel D. The linings which have been installed in Channel D are as follows:"

<u>Section</u>	<u>Type of Lining</u>
1D	Asphaltic concrete
2D	Asphaltic Prime-Membrane
3D	Asphaltic Buried-Membrane
4D	Soil cement - "SP" soil
5D	Soil cement - "SF" soil
6D	Plastic soil cement -"SP" soil
7D	Sodium Silicate stabilized sandy loam

J. Howard Maughan reports on management of related irrigation and drainage enterprises.

"Study is being made in an irrigation and drainage area of Cache Valley extending across the Utah-Idaho state line. The study area including about 30,000 acres of irrigated land is located in a triangle formed by the low bluff south of Preston and the Bear and Oub Rivers to their confluence south of Lewiston. The Oub River Irrigation Company and four subsidiary ditches; together with extensions of two other irrigation companies provide the irrigation supply. Four organized drainage districts and a number of small private drainage enterprises provide drainage for the irrigated lands."

Silt Studies - Dean W. Bloodgood, Austin, Texas.-"All stencils for mimeographing 'Silt Load of Texas Streams, Part IX' (a progress report as of September 30, 1947) have been cut. This report will be mimeographed as soon as a map showing location of stations has been completed. The report should be ready for distribution early in September.

"Practically all of the streams where silt stations are located remain nearly dry due to the extended drouth situation. Most of the waters received at the laboratory are clear and little silt is noticeable. During the month, however, the Llano River was at flood stage for a short time, and there was considerable silt in the water from the Llano station. The long dry spell has caused the surface soils to be well drained of moisture and devoid of vegetative growth so when the hard rains do occur, there can be expected considerable from the dry eroded areas."

John S. James, Billings, Montana.-"In consultation with Mr. Francis and Mr. Anderson, definite plans were made for field surveys for the Hysham Bench group project. This project is of particular interest as it involves preparing a complete plan for a distribution system for a new irrigation project covering nearly 7,000 acres. Field work and detailed planning will be done largely by the Regional Engineering Division, and Mr. Francis has requested me to follow through and consult in all phases of the work. It is anticipated that Mr. Long and I will prepare the final report. It is hoped that this report can be completed by next spring so that the plan will be available during the next irrigation season when the project first delivers water."

Wayne D. Griddle, Boise, Idaho.-"A large part of the month was spent in studying the possible procedure to follow in making the new irrigation studies in this general vicinity. Conferences were held at the University of Idaho with the Experiment Station officials on August 16 to develop more fully the cooperative plans. On August 17 a conference was held for the same purpose with the U. S. Bureau of Reclamation officials at Boise. On August 30 and 31 tentative plans for the new work were presented to representatives of the Bureau of Plant Industry, who are included in the general memorandum of understanding for the new research work. Preparation of the final project outline and plans are now well under way and just as soon as personnel are available to begin field studies it is proposed to choose some field sites to begin on."

Snow Surveys and Irrigation Water Supply Forecasts - Carl Rohwer, Fort Collins, Colorado.-"One new snow course was established on the San Miguel River, and preliminary locations were made for new courses on the Rio Grande in Colorado above Wagon Wheel Gap. The possibility of locating additional courses on the North Platte drainage in the Medicine Bow Forest was investigated. The new courses on the Rio Grande and North Platte were requested by the Bureau of Reclamation.

"Colorado Experiment Station Publication, Miscellaneous Series Paper No. 418, 'Summary of Snow Survey Measurements of the Missouri-Arkansas Drainages' was published in August.

Well Screen Performance Tests.-"Progress on the Well Screen Project accelerated during August. Carl Rohwer, with the assistance of Gilbert Corey and Donald Matejka, completed the preliminary tests of the equipment for testing the screens and made loss of head studies on 12-inch Johnson well screens with 0.20 and 0.01-inch slot openings. The screens were tested for discharges ranging from 1/8 to 2 cubic feet per second. Under these conditions the losses through the screen with 0.20-inch slots was less than 0.001 foot. When discharging 2 cubic feet per second through the screen with 0.01-inch slots the loss was about 0.10 foot.

"Some difficulty was experienced in making tests on the screen with fine slots because fine particles of trash in the water clogged the openings in the screen. Unbleached muslin is being used to strain out these fine particles but this method is not too satisfactory because the particles clog the muslin strainer. The water system of the laboratory was flushed with a fire hose and then fresh water was drawn from the city mains, but this did not improve conditions. For this reason screens with larger openings will be tested until the water becomes clearer."

Stephen J. Mech, Prosser, Washington.-"August was a month of almost continuous irrigation testing. A total of 63 plot irrigations were made during the month. The plots are being irrigated so that the available soil moisture level is maintained nominally between 100-75 percent, 100-60 percent, and 100-35 percent. Since the potatoes started growing it has required 5, 2, and 1 irrigation for each moisture group respectively since the last week of July. It is estimated that the irrigating season on late potatoes is about half over.

"Perhaps the most conspicuous observation is that irrigating at the three different soil moisture levels has resulted in a considerable difference in the rate of infiltration on the three blocks. Though the amounts of water added to each group is just enough to raise the 4-foot root zone to field capacity, the fairly large difference in the infiltration rate of the three groups reduces the difference in the duration of actual irrigation. Maintaining the available soil moisture between 75-100 percent requires irrigation about every 8 days. On a 7 percent slope the result is a very low infiltration. The plots which are irrigated at an available soil moisture level of 35 percent are irrigated approximately every 22 days. They seem to have a considerably greater infiltration and take only a little longer to add much more water to the soil. This seems to be a repetition of what was found in alfalfa last year.

"It was also noticed that when the vines covered the ground, the surface soil did not dry out as much as it did when the vines were small. This shading influence must offset the increased transpiration by the increased vegetative growth. The net result may well be very little difference in the net soil moisture withdrawal.

"In between irrigations the potatoes were dusted with 5 percent DDT on August 3. On August 16-17 they were all cultivated for the second and last time and hilled. The vines have now completely covered the space between the 36-inch row."